

REMARKS/ARGUMENTS

Claims 1-11 were pending in this application, of which claims 5-11 were withdrawn from consideration. Claims 1-2 and 4 have been amended, and claims 5-11 have been canceled without prejudice or disclaimer as being drawn to a non-elected invention. Hence, claims 1-4 remain pending following entry of the present amendment. Support for the present amendment may be found throughout the specification and original claims, *e.g.*, Para. [0035], [0068], *etc.* As such, no new matter enters by way of the present amendment. Entry of the present amendment, and reconsideration of the subject application as amended is respectfully requested.

Allowable Subject Matter

The Examiner is thanked for the indication that claims 3 and 4 are allowable. These claims are maintained, and a Notice of Allowance is respectfully requested. It is noted that claim 4 has been amended to clarify minor editorial corrections. However, such amendments do not narrow the scope of the claim in any regard.

Objection to the Drawings

The drawings have been objected to because the figures allegedly do not show each and every feature of the claimed invention. The Office Action alleges that the claims recite that the first electrode is driven into the flow channel, and that such feature is not shown in the claims. The claims have been reworded to clarify that the first electrode is driven towards the second electrode thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel. Such features are clearly described and illustrated in the figures, *e.g.*, the elements are illustrated in Figure 1A and the nonactuated/actuated valve shown in Figures 2A and 2B. As such, it is submitted that all features of the claims are shown in the figures. As such, withdrawal of this objection is respectfully requested.

Claim Rejections Under 35 U.S.C. §102(b)

A. Biegelsen

Claim 1 stands rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,971,355 to Biegelsen *et al.* (hereinafter "Biegelsen"). This rejection is respectfully traversed for at least the reasons which follow.

Claim 1 relates to a valve structure including an elastomeric layer defining a flow channel having walls and a deflectable ceiling, a first electrode, and a second electrode. The first electrode is positioned on top of the elastomeric layer so as to overlie the deflectable ceiling of the flow channel, and the second electrode is positioned beneath the flow channel. The electrodes are configured such that application of a potential difference between the first electrode and the second electrode drives the first electrode toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel. This mechanism of operation is illustrated by the structure shown in Fig. 1 of the application and related discussion at page 6, lines 1–8.

In contrast to the present claims, Biegelsen discloses a valve that operates by constructing the membrane 211 of a magnetically susceptible material and generating an alternating electromagnetic force with a top or bottom electrode to pull the membrane toward one or the other of electrodes (Biegelsen, column 12, lines 32–55). However, neither of the top nor bottom electrode is configured to be driven toward the other electrode, thereby forcing the membrane. Rather, the membrane itself is configured so as to be driven toward the exterior electrodes.

It is well established that to anticipate a claim, a reference must disclose every element of the claim. *Verdegaal Bros. v. Union Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913 (Fed. Cir. 1989).

The Office Action refers to Fig. 10 of Biegelsen as having two electrodes that open and close a valve in response to application of a potential difference (Office Action, page 4). Further, the Office Action references the diaphragm (membrane 211) as an electrode "as it is an electrically conductive member." *Id.* However, the cited embodiment of Biegelsen operates

without driving an electrode overlying the ceiling of the flow channel toward another electrode at the floor of the flow channel, as required by the claim.

Whatever else Biegelsen may disclose, there is no disclosure of a first electrode positioned on top of an elastomeric layer so as to overlie the deflectable ceiling of the flow channel, wherein application of a potential difference between the first electrode and the second electrode drives the first electrode toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel. Absent such teachings, Biegelsen does not disclose each and every element of the claims. For at least these reasons, withdrawal of this rejection is respectfully requested.

B. Cabuz

Claim 1 also stands rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,836,750 to Cabuz (hereinafter "Cabuz"). This rejection is respectfully traversed for at least the reasons which follow.

The Office Action cites Cabuz as having two electrodes that provide force on a diaphragm (Office Action, page 4). Further, the Office Action references the diaphragm as an electrode "as it is an electrically conductive member." *Id.* However, in contrast to the present claims, Cabuz teaches that the diaphragm 27 is coated with conductive material to respond to application of a voltage to one of the electrodes (Cabuz, column 5, line 64, through column 6, line 15). Such a configuration operates without driving an electrode overlying the ceiling of the flow channel toward another electrode at the floor of the flow channel, as required by the claim.

Whatever else Cabuz may disclose, there is no disclosure of a first electrode positioned on top of an elastomeric layer so as to overlie the deflectable ceiling of the flow channel, wherein application of a potential difference between the first electrode and the second electrode drives the first electrode toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel. Absent such teachings, Cabuz does not disclose each and every element of the claims. For at least these reasons, withdrawal of this rejection is respectfully requested.

Claim Rejections Under 35 U.S.C. §103(a)

A. Biegelsen in view of Gravesen

Claim 2 stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Biegelsen in view of U.S. Patent No. 5,452,878 to Gravesen *et al.* (hereinafter "Gravesen"). This rejection is respectfully traversed for at least the reasons which follow.

With regard to claim 2, the Examiner acknowledges that Biegelsen does not teach a micromirror surface positioned over the ceiling of the flow channel with a physical orientation of the reflective micromirror surface altered when the ceiling of the flow channel is driven into the flow channel. However, in support of the rejection, the Office Action cites to Gravesen and asserts that it would have been obvious to one of skill in the art to use the micromirror surface of Gravesen over the ceiling of the flow channel of Biegelsen in order to effect a deliberate change-over of light paths using the actuation device as taught by Gravesen. Applicants respectfully traverse.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The teaching or suggestion to make the claimed combination must be found in the prior art, and not be based on applicant's disclosure. *See* M.P.E.P. §§ 2143.01 and 2143.03.

Initially, even assuming, *arguendo*, that one would look to combine the teachings of Gravesen and Biegelsen, the moveable membrane 211 of Biegelsen is not located on an exterior surface of the disclosed valve system. As such, one of skill in the art would not consider the concept of a movable lever including a reflective surface to effect a change-over of light paths, as taught by Gravesen, to be suitable for application to the moveable membrane 211 of Biegelsen. Because the moveable membrane 211 is located in an internal portion of the valve system of Biegelsen, there would be no motivation to one of skill in the art to include a reflective surface of Gravesen, as there would be no incentive to include a reflective surface, so that a light source may be deliberately changed by the movement of the membrane, as taught by Gravesen.

Further, whatever else Gravesen does teach or suggest, it does not remedy the deficiencies of Biegelsen. Gravesen does not disclose or suggest a configuration wherein a first electrode positioned on top of an elastomeric layer so as to overlie the deflectable ceiling of the flow channel, wherein application of a potential difference between the first electrode and the second electrode drives the first electrode toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel.

For at least these reason, it is submitted that the claims are patentable over Biegelsen in view of Gravesen. As such, withdrawal of this rejection is respectfully requested.

B. Cabuz in view of Gravesen

Claim 2 also stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Cabuz in view of Gravesen. This rejection is respectfully traversed for at least the reasons which follow.

As discussed above with reference to Biegelsen, one of skill in the art would not consider the concept of a movable lever including a reflective surface to effect a change-over of light paths, as taught by Gravesen, to be suitable for application to the diaphragm 27 of Cabuz. Because the diaphragm 27 is located in an internal portion of the mesopump of Cabuz, there would be no motivation to one of skill in the art to include a reflective surface of Gravesen, as there would be no incentive to include a reflective surface, so that a light source may be deliberately changed by the movement of the diaphragm, as taught by Gravesen.

Further, whatever else Gravesen does teach or suggest, it does not remedy the deficiencies of Cabuz. Gravesen does not disclose or suggest a configuration wherein a first electrode positioned on top of an elastomeric layer so as to overlie the deflectable ceiling of the flow channel, wherein application of a potential difference between the first electrode and the second electrode drives the first electrode toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel.

For at least these reason, it is submitted that the claims are patentable over Cabuz in view of Gravesen. As such, withdrawal of this rejection is respectfully requested.

C. Gravesen in view of McCoy

Claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Gravesen in view of U.S. Patent No. 3,839,176 to McCoy et al. (hereinafter "McCoy"). This rejection is respectfully traversed for at least the reasons which follow.

The Examiner acknowledges that Gravesen does not teach an elastomeric layer defining a flow channel having walls and a deflectable ceiling. However, in support of the rejection, the Office Action asserts that it would have been obvious to have made the material selection of an elastomeric material for the diaphragm layer (12) of Gravesen based on the teachings of McCoy in order to provide a material that can insulate the electrode and be resistant to fouling by contaminants. Again, Applicants respectfully traverse.

Gravesen teaches that the insulating layer, *i.e.*, the alleged diaphragm layer, firstly serves to ensure that no short-circuiting can occur between the diaphragm and the carrier, which would cause the electrostatic field to collapse and, secondly, defines the dielectric which is a determining factor of the characteristic of the field strength of the electrostatic field between the diaphragm and the carrier. *Gravesen*, Col. 2, lines 8-15. To select materials for the insulating layer, one of skill in the art would look primarily to the express teachings of Gravesen regarding the intended purpose of the insulating layer, rather than to the unrelated teachings of McCoy. For instance, based on the teaching of Gravesen, one of skill would select a material specific to the electrostatic field and dielectric needs of the specific use at hand. Further, it is submitted that one of skill in the art would not look to incorporate the rubber, resin, and polymeric materials disclosed in McCoy into the etching process disclosed in Gravesen without the need for undue experimentation. *Gravesen*, Col. 5, lines 35-39. As such, it is submitted that one of skill in the art would not look to combine the teachings of Gravesen and McCoy in the manner suggested.

Accordingly, the cited art does not teach or suggest each and every limitation of the present claims in that there is no teaching or suggestion of a valve structure including an elastomeric layer defining a flow channel having walls and a deflectable ceiling, a first electrode positioned on top of the elastomeric layer so as to overlie the deflectable ceiling of the flow channel, and a second electrode positioned beneath the flow channel, wherein application of a potential difference between the first electrode and the second electrode drives the first electrode

toward to second electrode, thereby driving the first electrode and the deflectable ceiling of the flow channel toward the floor of the flow channel to close the flow channel.


For at least these reason, it is submitted that the claims are patentable over Gravesen in view of McCoy. As such, withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



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